The Tree System of Washington

by

C. Lanham

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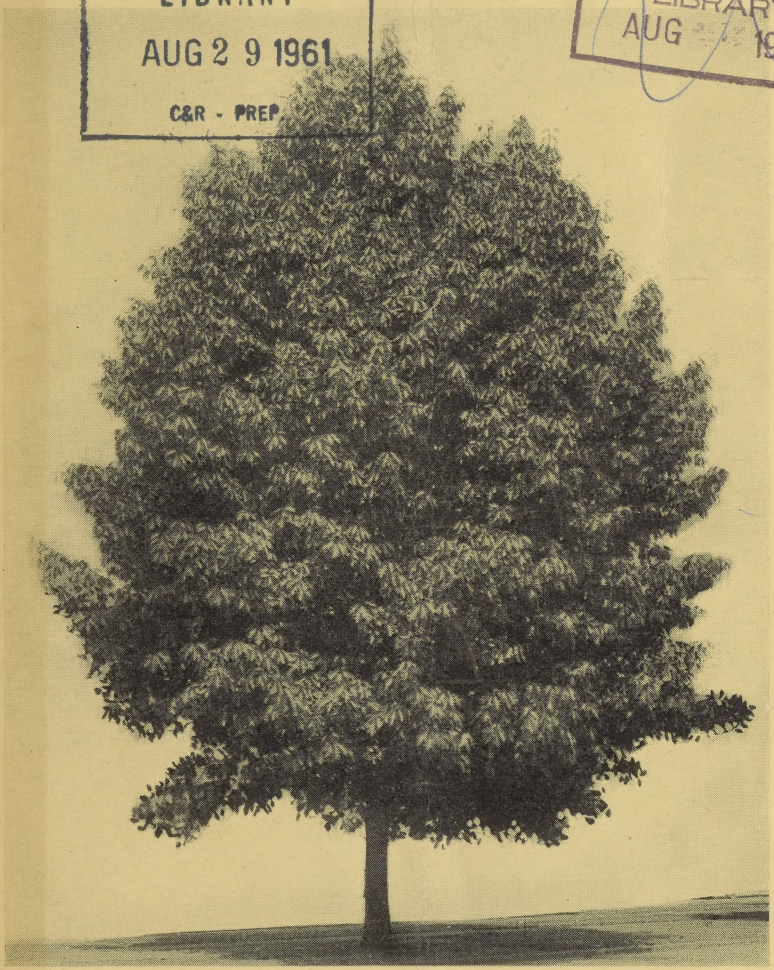

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The Tree System of Washington

THE systematic planting of trees on the streets of Washington, D. C., was commenced in the fall of 1872 when the city was under the administration of Governor Alexander R. Shepherd. A great deal of grading was done at that time; roadways were narrowed and street parkings formed. Previous to these changes pavements were laid so close to the houses that the curb line in many instances was not more than eight or ten feet from the buildings, leaving no room for trees. This was probably one of the reasons why street planting had not been undertaken before. There were, however, trees existing that had been planted by private individuals; but the irregularities of spacing necessitated their removal when systematic planting was undertaken.

Governor Shepherd appointed Messrs. William R. Smith, John Saul, and William Saunders, experienced horticulturists, to act as an advisory board without compensation. It was the duty of these men to select trees considered most suitable for street planting. At that time this parking commission thought it best to plant trees of as rapid growth as could be obtained; consequently, a majority of the trees were soft-wooded, faster in growth than the hard-wooded species. Thus the Carolina poplar (*Populus deltoides*), Lombardy poplar (*Populus nigra italica*), silver maple (*Acer dasycarpum*), and the ash-leaf maple (*Acer negundo*) were planted in large numbers and gave the desired results.

Because of the tendency of the poplars (often known as "surface rooters"), to raise pavements, curbs, and roadways by their excessively vigorous growth near the surface, nearly all of them have been eliminated and replaced by hard-wooded trees.

Silver maples at one time existed in greater numbers on the streets than any other variety, but their planting has been discontinued because of the brittle nature of their wood. They were also found to be short-lived, and the streets too dry for their requirements. These are being replaced with hard-wooded and longer-lived trees.

Pin Oak and Sugar Maple, New York Avenue N. W.

soil, others in more moist and heavier ground; and it was fully demonstrated that they could be successfully planted on the streets, and that they would thrive in one place as well as in another.

It is always desirable, when practicable, to plant a street with one variety only, as the beauty produced by repetition and continuity of the same object is lost when a mixture of species of trees different in form of growth and diversified as to foliage is introduced.

When systematic planting was undertaken here it was necessary to purchase trees from nurseries remote from the place of planting. They were received in bales and boxes; and it was found that the roots of some had been destroyed by overheating, caused by the packing material being too wet; while others were killed because the packing material was too dry. The losses many times amounted to as high as fifty per cent.

After such experiences the authorities were convinced of the necessity of establishing a nursery where city trees could be grown. This was done, and, with few exceptions, all the trees planted on the streets during the last forty years have been grown in city nurseries, decreasing the losses in transplanting from the nurseries to approximately four per cent. Careful examination might lead one to believe that statement to be erroneous; but the four per cent refers only to trees which die from natural causes (transplanting). The other causes of death are from gas and water leakage, the contact of the roots with asphalt and coal tar from the old coal-tar pavements which were being torn up, the mutilation of roots, girdling, being filled around, and other injuries incidental to street work.

Street planting has become more costly in recent years because of the scarcity of good soil, which when obtained at all has to be hauled from great distances, and generally from a remote location opposite to that where the rejected earth from the excavation is dumped. This, and the higher prices of labor and material of all kinds for planting, together with the necessity for increasing the size of the excavations, and the additional amount of soil required because of changed surface conditions, have helped to increase the cost. When long-distance hauls have prohibited the purchase of good soil, hand-swept street cleanings, mixed with earth excavated from the tree spaces, have been used extensively. The results obtained from this process

Red Oaks (*Quercus rubra*) 12th Street between B Street N. W. and B Street S. W.

have been satisfactory in clayey soils, as it improves the physical condition of the soil and makes it suitable for plant growth; but where the ground is sandy or gravelly, this mixture lightens the soil to such an extent that the water percolates through the ground leaving the surface very dry, even a few hours after a heavy shower. With the advent of the automobile, however, the supply has disappeared.

The old trees of the system provide the seeds with which to grow the new. The time for seed gathering and sowing varies. The elm seeds are gathered and sown during the month of May; the Norway and sugar maples about the first of November; the acorns from the oaks are gathered as soon as they ripen in autumn; and the seeds from the American linden and gingko during the same season. The sycamore seeds, gathered from the oriental plane trees in the United States Capitol grounds about the first of December, are sown as the weather will permit during a period from March fifteenth to April fifteenth.

After the seedlings reach a height of eighteen to twenty-four inches, they are transplanted from the seed beds to nursery rows six feet apart, and set six feet from each other in the rows where sufficient space is provided for them to thrive.

While standing in these rows they are cultivated regularly. This cultivation keeps the ground in condition to subserve rainfall, and at the same time cuts the roots and prevents them from crossing from row to row. When these roots are cut they throw out rootlets closer to the tree so that when the tree is lifted the majority of the roots extending on the sides of the rows are not injured, and only those on the two sides of the tree are mutilated to any extent. This constant and regular cultivation takes the place of root pruning, frequently mentioned by nurserymen, and saves the cost of transplanting several times in the nursery rows before setting the trees out in their permanent positions on the streets.

During the time the trees are growing in the nursery attention must be given to pruning and training them. The operations required in this line will have for their object the preservation of a well-defined, central, leading shoot. Should side branches appear to dispute the vigor of growth of this shoot, they should be pruned back, but

Gingko (*Salisburia adiantifolia*) intersections of 16th Street, Massachusetts and Rhode Island Avenues N. W.

not entirely removed until later on. The preservation of side branches tends to strengthen the main stem, and they therefore are to be encouraged to a certain extent, but always subordinate to the main stem.

PREPARATION OF TREE SPACES:

Excavations on the streets are made of a size sufficiently large to contain not less than sixty-three cubic feet of good soil. The spaces are of an oblong shape, seven feet long, three feet wide, and three and one-half feet deep. The shape of the hole has nothing to do with the growth of the tree, but simply enables the laborer to work to good advantage. It is, however, very important that a depth of three and one-half feet be adhered to, although the size of the hole may be diminished on slightly filled ground. With these preparations the trees are given a good start in life. When the tender roots reach the hard, unprepared places they will have gained sufficient strength to force themselves into it.

The best time to plant deciduous trees is at a period between the falling of the leaves in autumn and the leafing out in spring. No planting should be undertaken in mid-winter when the ground is generally frozen or muddy, but at such a time between these periods when farming work can be performed. Fall planting might be considered preferable to spring planting for the following reasons: the soil in autumn for some inches below the surface is several degrees warmer than the atmosphere surrounding it. This condition promotes the growth of roots when the colder atmospheric conditions prevent the growth of buds and leaves. Therefore, trees planted in autumn, having made this root growth, are prepared to promote leaf growth in the spring. Trees planted in spring, when the air is warmer than the ground, leaf out before they have formed any root growth; and should a severe, hot, dry spell occur, the lack of this root growth would be felt and the loss probably heavy. Yet experience has shown that trees planted in autumn in ground that has not been settled by rains often suffer the destruction of their roots by frost that penetrates to such a depth. Therefore, it may be said that the chances of success in each of the two seasons are about even.

Lindens (*Tilia Americana*) Massachusetts Avenue N. W., east of 18th Street.

BOX-GUARDS:

The custom in this city has been to surround the tree as soon as it is planted with a wooden box for protection against accidents and as a support. This box is about six feet high, made of pine slats three inches in width and one inch in thickness, fastened to frames of heavier material, one at the bottom and one at the top, the bottom frame being sixteen inches square and the top frame ten to twelve inches square. These boxes are fastened securely by driving four chestnut stakes about the frame, one on each side, in a slanting direction, and well nailed thereto. The tree is then fastened by leather straps passed about the stem and nailed to the top of the box. It is highly important that these straps be entirely free from oil, as the oil in straps has frequently caused the death of trees. Two straps are required to prevent the tree from rubbing against the top of the box and to hold it perfectly rigid so that it will not be shaken by brisk or fierce winds. When the tree is shaken by such winds it tends to loosen the soil, giving access to air which causes the roots to dry and produce serious results.

In the nursery rows, as in a forest, the tender trunks are protected from hot sun rays and cold blasts by their neighbors. The box serves the same purpose of shading the stem and preventing sun rays, reflected from the hot sidewalks from scorching it during the summer months, and from cool winds of winter. In a number of instances young lindens and horse-chestnuts in this city, when not protected by this framework, have been injured by sunscald and freezing, while those with boxes around them have not suffered. Except for appearances I do not believe these boxes can be improved upon.

WIRING:

For several years after the wooden boxes were removed from around trees it was found necessary to protect them by a wire netting, as much damage was being done by unhitched horses and careless persons. The constant growth of the tree necessitated jackets being put on loosely, otherwise its development would be impaired; but this operation formed such an expensive item that it was abandoned. However, a few trees are being wired at this time because they are in exposed places.

Sugar Maple (*Acer saccharum*), 19th Street N. W.

Congress was asked to provide for an inspector in this department, which it did. The work of this inspector has accomplished quite as much in the way of protecting trees against horses, etc., as did the wire netting. He was given police authority and was detailed on outside work with the object of enforcing, as far as possible, the police regulations pertaining to trees. He has authority to arrest and prosecute any driver of a vehicle who carelessly permits his horse to bite a tree; any plumber who, without permission, cuts a root; any telegraph lineman who cuts a limb or fastens a guy-wire to a tree; any contractor who piles material within three feet of a tree or attaches a guy-rope thereto; or any person who uses a tree for advertising purposes. Persons violating these regulations are taken into court, where they have been fined one to fifty dollars for such offenses. In this manner such offenders have been taught that this sort of public property is to be protected as well as any other.

TRIMMING:

A great deal of trimming is required on street trees in order to prevent their encroachment on buildings and interference with street and sidewalk traffic. This operation is not considered best for their welfare in all cases; but in instances such as those mentioned above it is imperative. In this connection it may be said that the 23,000 silver maples, once on the streets of Washington, required a greater expenditure of money than did the remaining approximately 75,000 trees of other varieties. This is one of the reasons the use of the silver maple has been discontinued.

It will always be considered that the worst trimming street trees can receive is heading in, as the cutting off of their tops is termed. This treatment has been found necessary in a great number of instances with the soft or silver maple, it being a common thing to see large numbers of them which had been in apparently good condition the previous summer, showing dead tops for eight or ten feet the following season and a vigorous growth in the lower parts. Their condition did not warrant removal even if money for such purposes had been available; but because of the unsightliness and ever present danger of their falling in the street, the dead tops were not allowed to remain. This operation of heading off well down into the live wood

Elms (*Ulmus Americana*), New Hampshire Avenue N. W., north of Corcoran Street N. W.

prolongs the usefulness of the tree and prevents its death which would come within a few years should such attention be omitted. However, when it is necessary to resort to this treatment the tree has but little while to live and the sooner this variety is eliminated the better.

There are some trees that respond to severe pruning more satisfactorily than others. One of the best in this respect is the sycamore, which can be trimmed so as to form a mere skeleton pyramid. This is best done after the leaves have fallen in late autumn or early winter. To accomplish the desired result, the lower branches should be cut from six to eight feet from the trunk, and should taper towards the top until the desired height is reached, where the branches ought not to exceed six inches from the main stem. After such treatment it will send out young growth at every cut regularly and evenly over the entire system, and, after one year's growth, will present a columnar mass of foliage, bearing out fully and distinctly the pyramidal shape, and increasing in beauty from year to year for many years without further attention so far as pruning is concerned. Trees of this specie which have undergone this method of pruning have always presented symmetrical, pyramidal shapes of great beauty.

INSECTS:

The trees of this city for a number of years have suffered severely from the attacks of insects, principally the elm-leaf beetle, the tussock moth, and the fall web worm. For years these pests were kept in check to some extent by severe pruning of the affected branches; but this method resulted in little success. The department then resolved to purchase spraying machines as a means of coping with the situation. It now has four high-powered sprayers, two of them horse drawn, and two, more recently acquired, operated by tractors. The two latter machines are operated continually from the time the insects appear until they are checked; the others are kept for emergency work, as times occur when more than two are necessary. Arsenate of lead has proven to be most effective as a poison for spraying. It exterminates the insects by poisoning their food supply.

Pin Oaks (*Quercus palustris*), Connecticut Avenue Extended.

GAS LEAKAGE:

There is considerable loss of trees from gas leakage. The escaping gas permeates the soil and destroys the roots. Perfect immunity from this evil is almost unattainable. When detected, unfortunately, the damage has been done, and in the majority of instances it is too late to save the tree. After the tree has been removed and the pipes repaired, fresh soil should be supplied and a new tree planted. This may not always prove successful at first, as it is a difficult matter to remove all the poisoned earth. Sometimes several removals will be required before a healthy growth is again secured.

It may be noted that gas-poisoned soil is the unsuspected cause of the deaths of many city trees.

REMOVING:

All employees of this department, other than day laborers, are requested to report promptly all trees found dead, decayed, or dangerous, coming under their observation. These are removed and replaced as rapidly as practicable.

CONCLUDING REMARKS:

Certain conditions arising in recent years have made the life of street trees more hazardous. Curb trees are frequently struck by automobiles that crash into and break the boxes, cut the bark, and in many instances knock the tree down. Trees in the vicinity of gasoline stations and automobile repair shops generally die from the effects of gasoline and oil collecting in the tree spaces. Finally, since the increase in the production of ice cream, the number of casualties from salt water has necessitated the incorporation into the police regulations a clause restraining manufacturers and retailers from dumping salt or dripping salty water in the vicinity of tree spaces.

As a matter of cleanliness, if for no other reason, weeds should be kept from around the tree. The surface of the holes in which trees are planted should be kept several inches below the surface of the pavement in order that rain water may have access to the roots. Attempts made to keep this surface lawnlike in appearance prove that it is not advisable, as the grass, even if kept closely cut, will collect dust and débris, and in a short time will become

Horse Chestnut (*Aesculus hippocastanum*), 13th Street N. W.

mounded around the stem, completely throwing off water. Even where weeds are kept down, an accumulation of dust will exist, making the lowering of the surface a routine necessity.

When the planting of trees on the streets of Washington was inaugurated many nurserymen claimed that they could do the work at one-third the cost that the District was then paying. Small contracts were given them, but the trees thus planted, except in very few instances, had to be removed within a few years.

Success in tree planting on streets may be attributed to the maintenance of a municipal nursery, where trees can be grown and cared for by those most interested in their welfare.

The present form of government in the District of Columbia has been in effect since the year 1878. Since that time this branch of work has been conducted under the direction of the Engineer Commissioner of the District of Columbia, through his assistants, who are United States Army officers of the Corps of Engineers.

The personnel of the office consists of a superintendent, assistant superintendent, one inspector, one computer, two clerks, and five foremen. A card index system is kept to show when and where trees are planted, cultivated, trimmed, sprayed, wired, cemented, and removed.

C. Lanham,

Superintendent Trees and Parking, D. C.

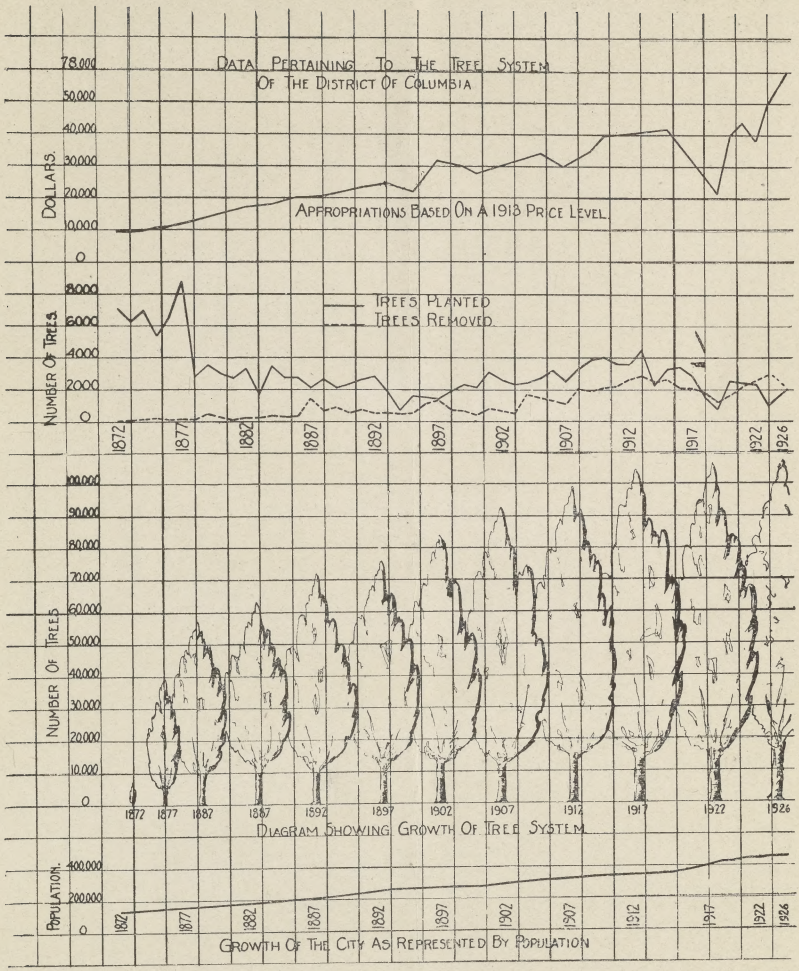
March, 1926.

BDP.

Spraying Trees.

Red Oaks (*Quercus rubra*), Central parking of Pennsylvania Avenue S. E.

Intersection of Pennsylvania Avenue and C Street S. E.



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